ABSTRAK

Penelitian ini menginvestigasi dampak dari implementasi pengembangan program perkuliahan *problem based learning-science, technology, engineering, and mathematics* (PBL-STEM) terhadap literasi lingkungan dan kreativitas mahasiswa calon guru kimia. Literasi lingkungan terdiri dari dimensi kompetensi lingkungan, pengetahuan lingkungan, dan sikap terhadap lingkungan. Kreativitas mencakup dimensi kelancaran, keluwesan, orisinalitas, dan elaborasi. Literasi lingkungan dan kreativitas mahasiswa dievaluasi menggunakan seperangkat instrumen evaluasi yang telah dinyatakan layak secara konten dan konstruk serta akseptabel. Penelitian ini menggunakan *design and development research* untuk mengumpulkan data. Mahasiswa calon guru kimia dilibatkan sebagai subjek penelitian dan dibagi menjadi dua kelompok, yaitu eksperimen dan kontrol. Dalam perkuliahan Kimia Lingkungan, kelompok eksperimen mengimplementasikan PBL-STEM, sedangkan kelompok kontrol mengimplementasikan PBL. Data yang diperoleh dari hasil evaluasi awal dan akhir dikalkulasi uji beda rata-rata peningkatan dan *effect size*-nya. Hasil uji statistik menunjukkan bahwa literasi lingkungan, kompetensi lingkungan, pengetahuan lingkungan, sikap terhadap lingkungan, kreativitas, keluwesan, orisinalitas, dan elaborasi mahasiswa di kelompok eksperimen meningkat secara signifikan dibandingkan kelompok kontrol. PBL-STEM memberi dampak dengan kategori sedang pada pengetahuan lingkungan dan sikap terhadap lingkungan, serta kemampuan lain dengan kategori kuat. Hasil penelitian juga menunjukkan bahwa PBL-STEM memberikan dampak positif pada mahasiswa berprestasi akademik sedang dan tinggi serta mahasiswa berpotensi kreatif rendah dan sedang terhadap peningkatan literasi lingkungan dan kreativitas. PBL-STEM dalam perkuliahan Kimia Lingkungan memiliki beberapa karakteristik: 1) Mengkaji masalah lingkungan secara berkelompok; 2) Menggagas dan mendesain ide pemecahan masalah lingkungan, menguji coba dan mengevaluasinya; dan 3) Menyebarluaskan pemecahan masalah lingkungan tersebut.

Kata kunci: Kimia Lingkungan, kreativitas, literasi lingkungan, mahasiswa calon guru kimia, PBL-STEM

ABSTRACT

This research investigates the impact of the lecture program developed by implementing problem based learning-science, technology, engineering, and mathematics (PBL-STEM) to environmental literacy and creativity of the prospective chemistry teachers. Environmental literacy consists of dimensions of environmental competence, environmental knowledge, and attitudes toward the environment. Creativity includes dimensions of fluency, flexibility, originality, and elaboration. Environmental literacy and prospective chemistry teachers' creativity are evaluated by using a set of evaluation instruments that have been shown to be valid and acceptable on its content and construct. This research used a design and development research to collect the data. Some of the prospective chemistry teachers were involved as the subjects of the study and were divided into two groups, namely experiment and control. In the Environmental Chemistry lecture, the experimental group implemented PBL-STEM, while the control group implemented the PBL. Data obtained from the results of the pre and post evaluation were calculated by using t-test for its increase and effect size. The results of statistical tests show that environmental literacy, environmental competence, environmental knowledge, attitudes toward the environment, creativity, flexibility, originality, and elaboration of the prospective chemistry teachers in the experimental group were significantly increased compared to the control group. PBL provides a moderate impact on environmental knowledge and attitudes towards the environment, and other capabilities in the strong category. The results also show that PBL-STEM provides benefits to the prospective chemistry teachers who have moderate and high academic achievement, as well as who have low and moderate creative potential on the increased literacy of the environment and creativity. PBL-STEM in Environmental Chemistry lectures has some characteristics: 1) Assessing environmental problems in groups; 2) Initiating and designing environmental problem-solving ideas, testing and evaluating them; and 3) Disseminating the environmental problem solving.

Keywords: Creativity, environmental chemistry, environmental literacy, PBL-STEM, prospective chemistry teachers